FIG. 1

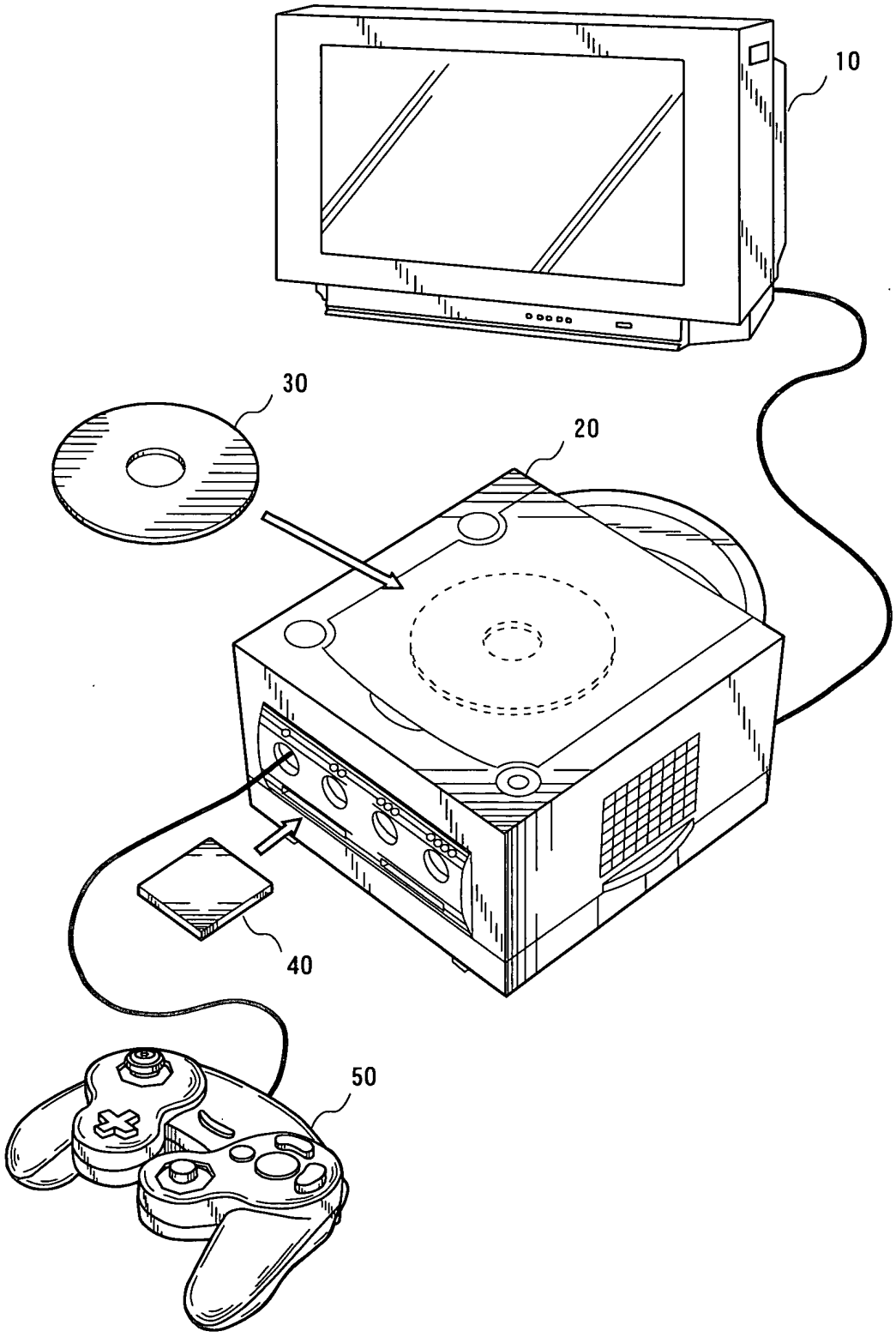


FIG. 2

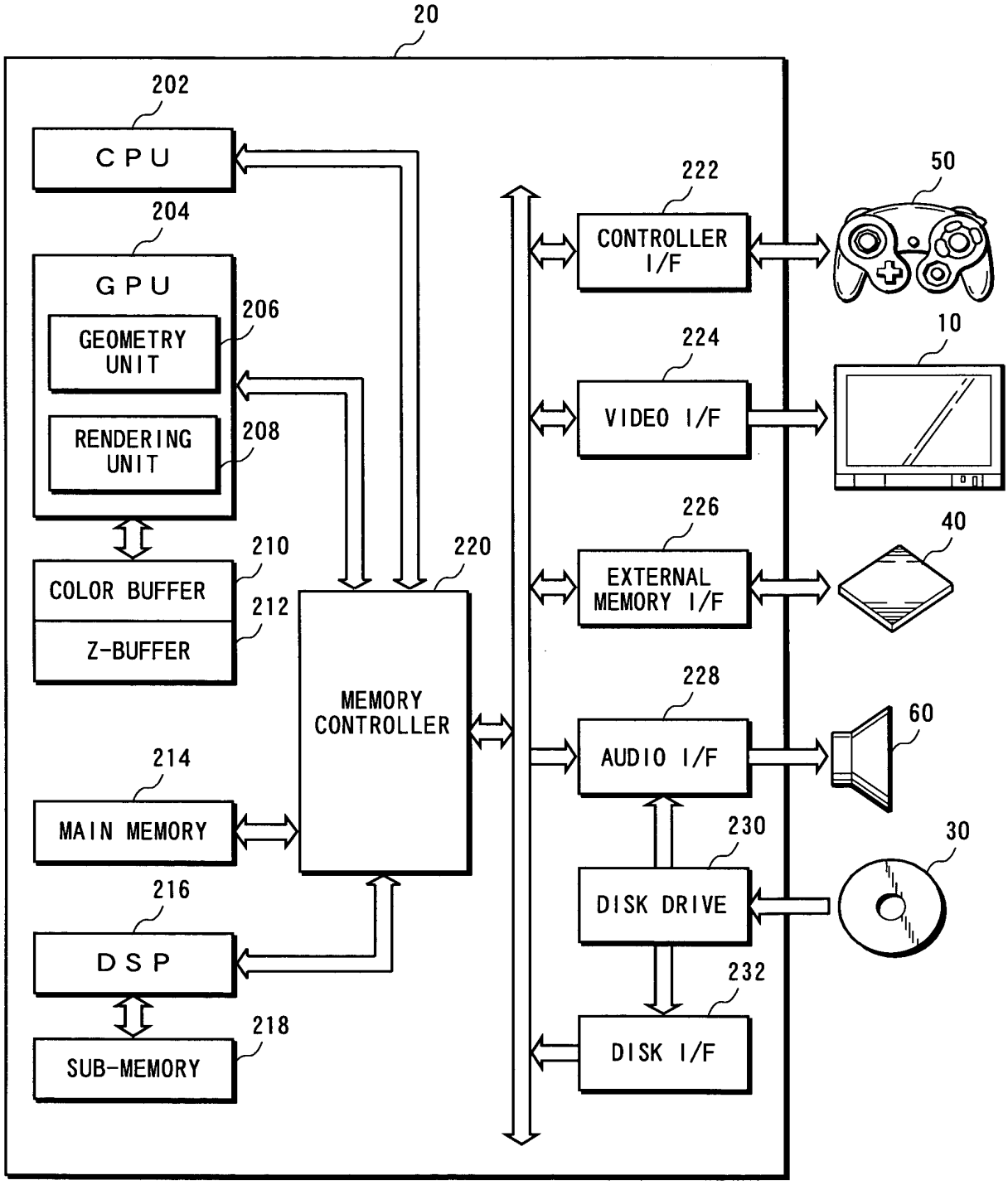

20
202
CPU
204
GPU
206
GEOMETRY UNIT
208
RENDERING UNIT
210
COLOR BUFFER
212
Z-BUFFER
220
MEMORY CONTROLLER
214
MAIN MEMORY
216
DSP
218
SUB-MEMORY
222
CONTROLLER I/F
50
224
VIDEO I/F
10
226
EXTERNAL MEMORY I/F
40
228
AUDIO I/F
60
230
DISK DRIVE
30
232
DISK I/F

FIG. 3

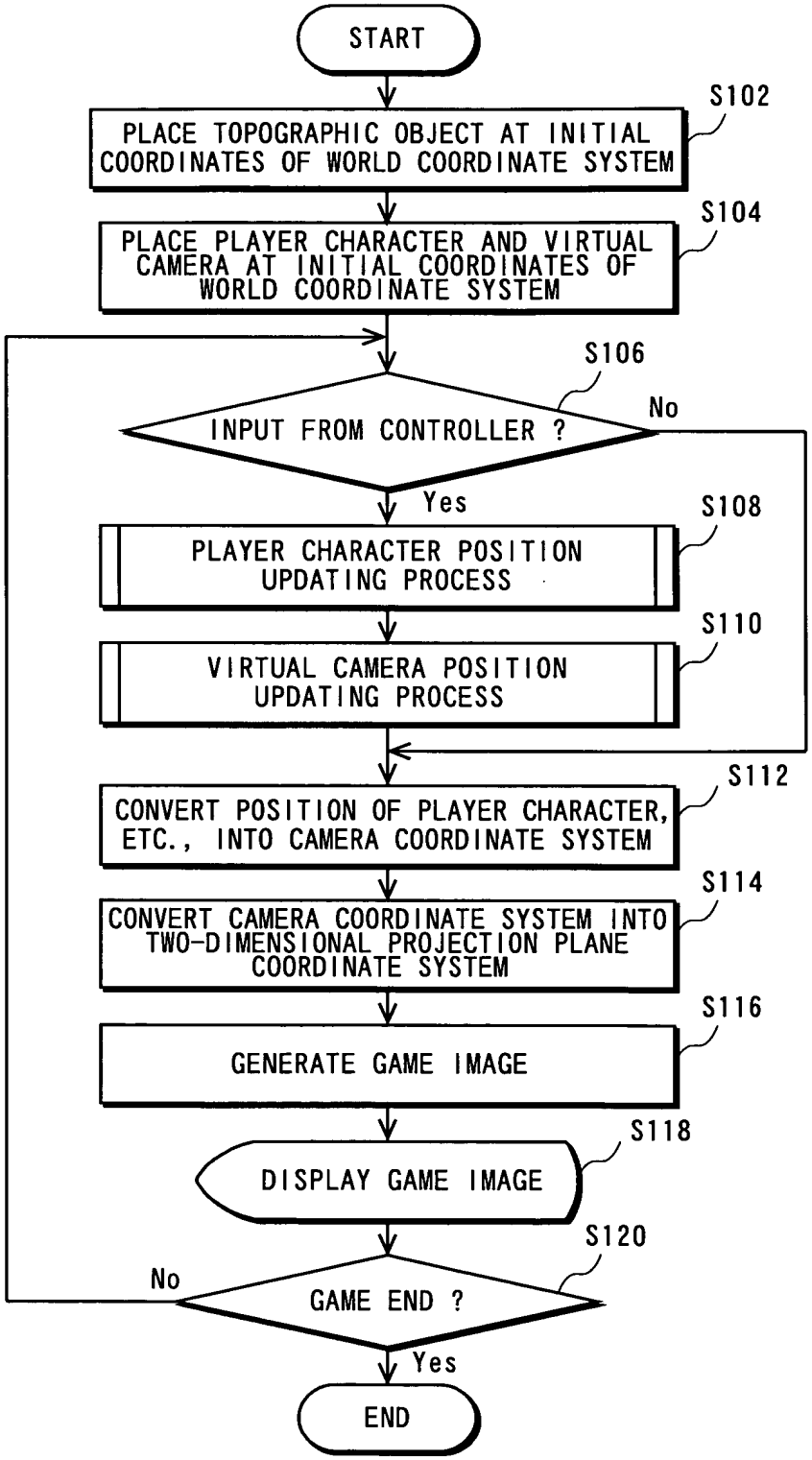

START
S102
PLACE TOPOGRAPHIC OBJECT AT INITIAL COORDINATES OF WORLD COORDINATE SYSTEM
S104
PLACE PLAYER CHARACTER AND VIRTUAL CAMERA AT INITIAL COORDINATES OF WORLD COORDINATE SYSTEM
S106
INPUT FROM CONTROLLER ?
No
Yes
S108
PLAYER CHARACTER POSITION UPDATING PROCESS
S110
VIRTUAL CAMERA POSITION UPDATING PROCESS
S112
CONVERT POSITION OF PLAYER CHARACTER, ETC., INTO CAMERA COORDINATE SYSTEM
S114
CONVERT CAMERA COORDINATE SYSTEM INTO TWO-DIMENSIONAL PROJECTION PLANE COORDINATE SYSTEM
S116
GENERATE GAME IMAGE
S118
DISPLAY GAME IMAGE
S120
No
GAME END ?
Yes
END

FIG. 4

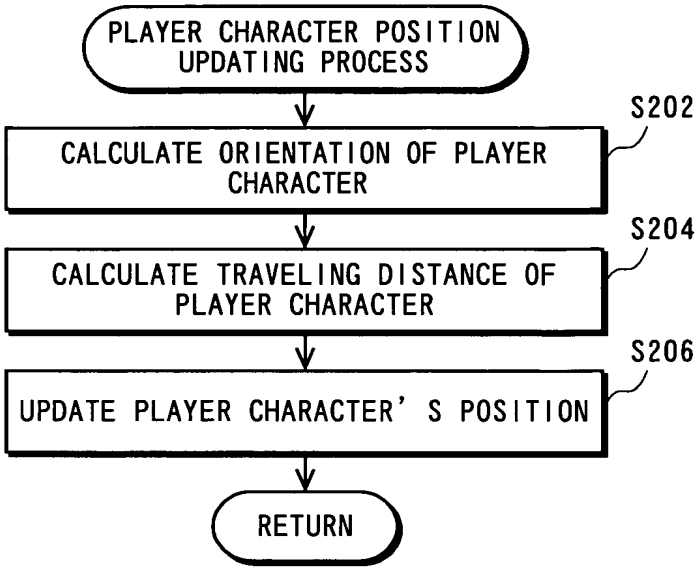

PLAYER CHARACTER POSITION UPDATING PROCESS
S202
CALCULATE ORIENTATION OF PLAYER CHARACTER
S204
CALCULATE TRAVELING DISTANCE OF PLAYER CHARACTER
S206
UPDATE PLAYER CHARACTER' S POSITION
RETURN

FIG. 5

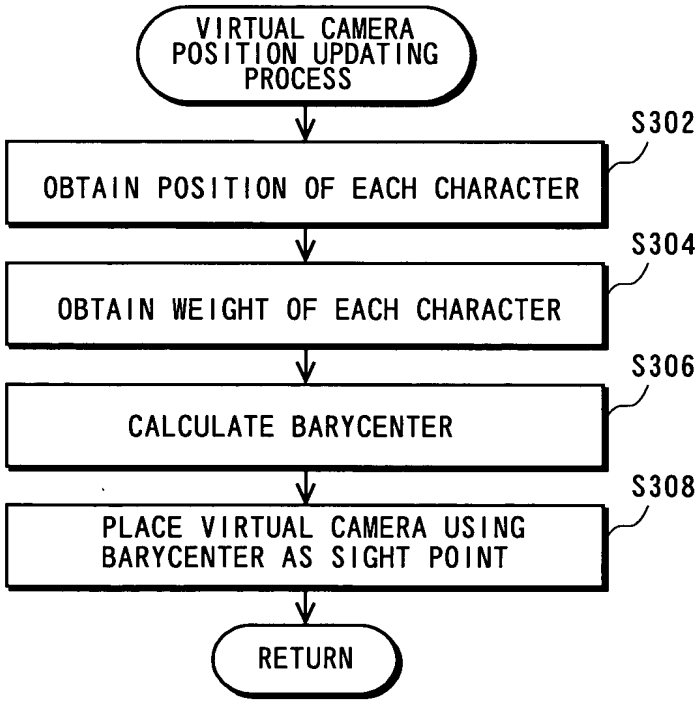

VIRTUAL CAMERA POSITION UPDATING PROCESS
S302
OBTAIN POSITION OF EACH CHARACTER
S304
OBTAIN WEIGHT OF EACH CHARACTER
S306
CALCULATE BARYCENTER
S308
PLACE VIRTUAL CAMERA USING BARYCENTER AS SIGHT POINT
RETURN

FIG. 6

CHARACTER	WEIGHT	POSITION
PLAYER CHARACTER	10	(Xp, Yp, Zp)
FRIEND CHARACTER f a	1	(Xfa, Yfa, Zfa)
FRIEND CHARACTER f b	1	(Xfb, Yfb, Zfb)
FRIEND CHARACTER f c	1	(Xfc, Yfc, Zfc)
FRIEND CHARACTER f d	1	(Xfd, Yfd, Zfd)
FRIEND CHARACTER f e	1	(Xfe, Yfe, Zfe)
⋮	⋮	⋮
ENEMY CHARACTER e a	3	(Xea, Yea, Zea)
ENEMY CHARACTER e b	3	(Xeb, Yeb, Zeb)
ENEMY CHARACTER e c	3	(Xec, Yec, Zec)
⋮	⋮	⋮

FIG. 7

CHARACTER	LEVEL OF IMPORTANCE
PLAYER CHARACTER	A
FRIEND CHARACTER f a	C
FRIEND CHARACTER f b	C
⋮	⋮
ENEMY CHARACTER e a	B
ENEMY CHARACTER e b	B
⋮	⋮

FIG. 8

LEVEL OF IMPORTANCE	WEIGHT
A	10
B	3
C	1

FIG. 9

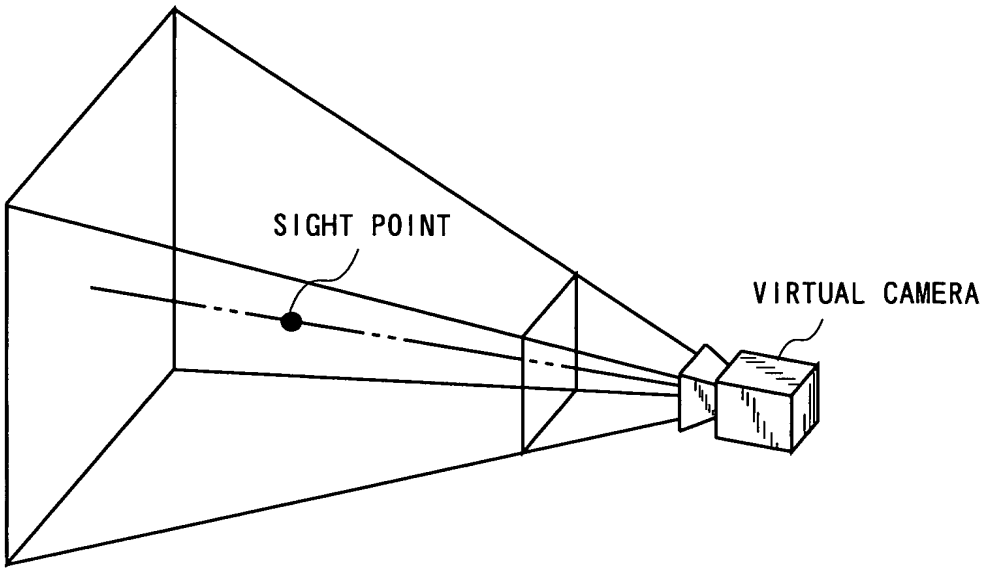


FIG. 10

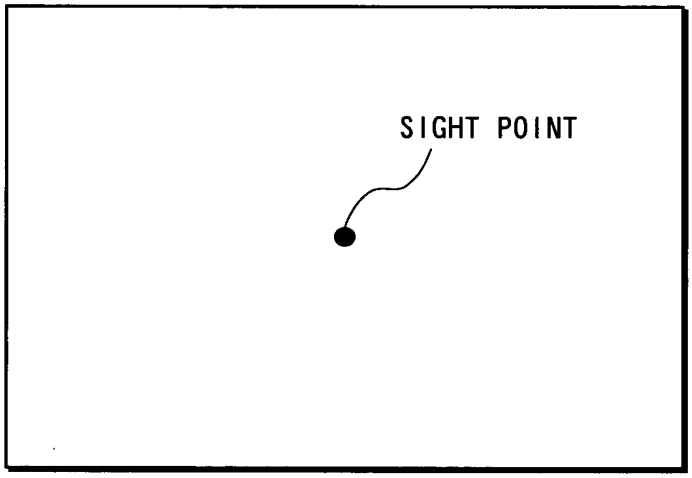


FIG. 11

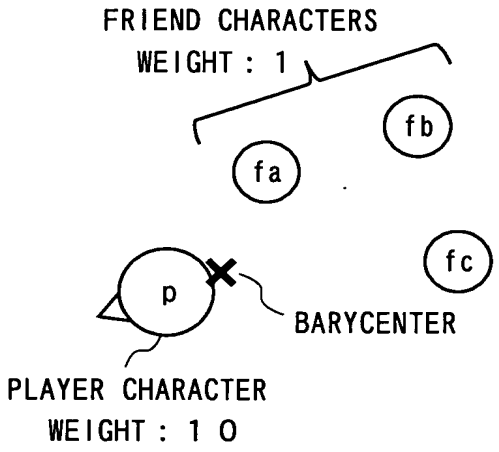

FRIEND CHARACTERS
WEIGHT : 1
fb
fa
fc
p
BARYCENTER
PLAYER CHARACTER
WEIGHT : 10

FIG. 12

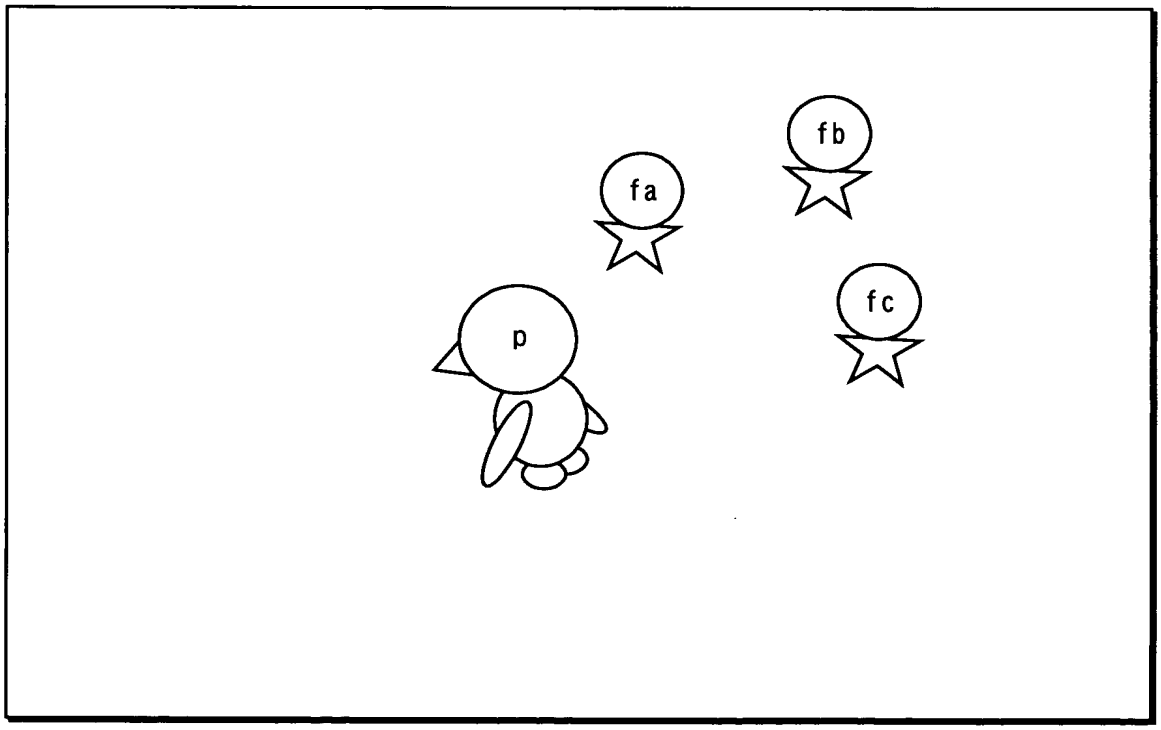

fb
fa
fc
p

FIG. 13

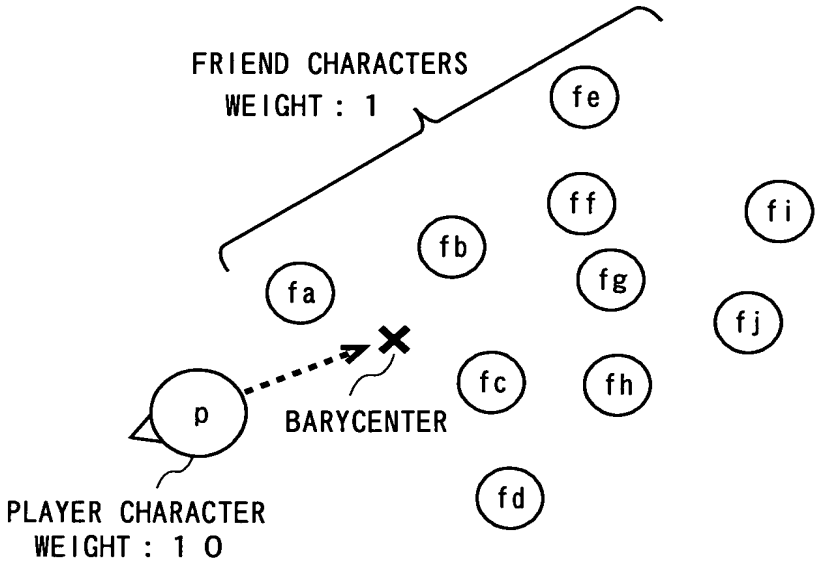

FRIEND CHARACTERS
WEIGHT : 1
fe
ff
fi
fb
fg
fa
fj
fc
fh
p
BARYCENTER
PLAYER CHARACTER
WEIGHT : 10
fd

FIG. 14

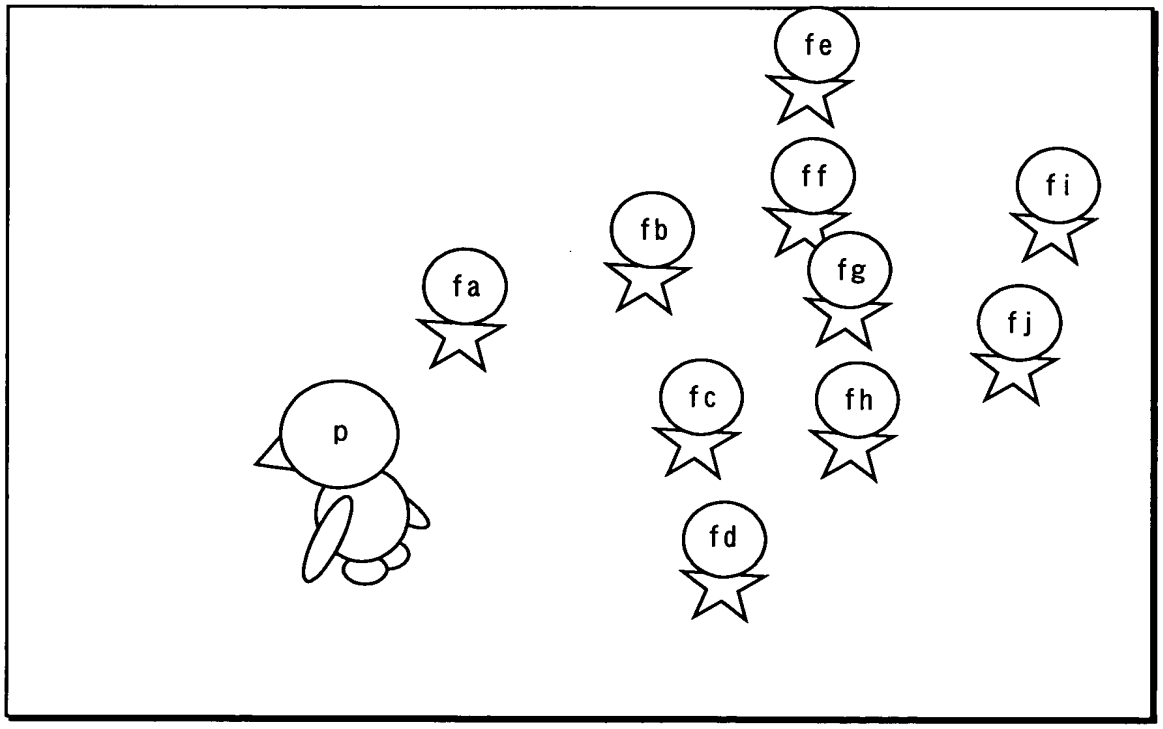

fe
ff
fi
fb
fg
fa
fj
fc
fh
p
fd

FIG. 15

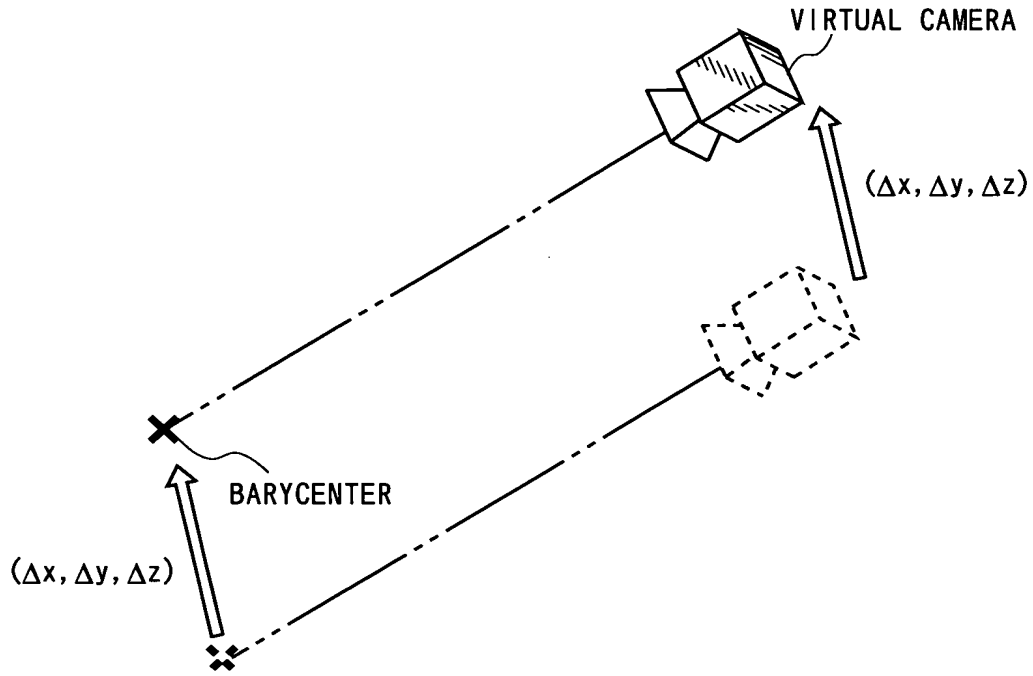

VIRTUAL CAMERA
(Δx, Δy, Δz)
BARYCENTER
(Δx, Δy, Δz)

FIG. 16

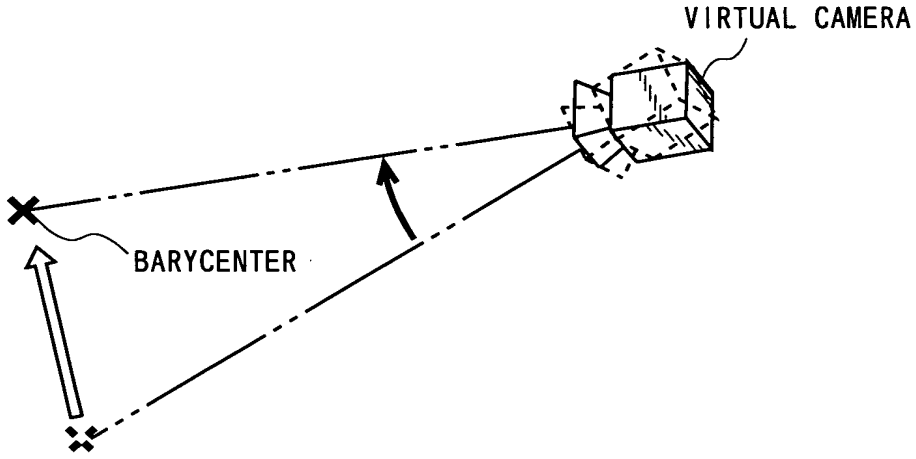

VIRTUAL CAMERA
BARYCENTER

FIG. 17

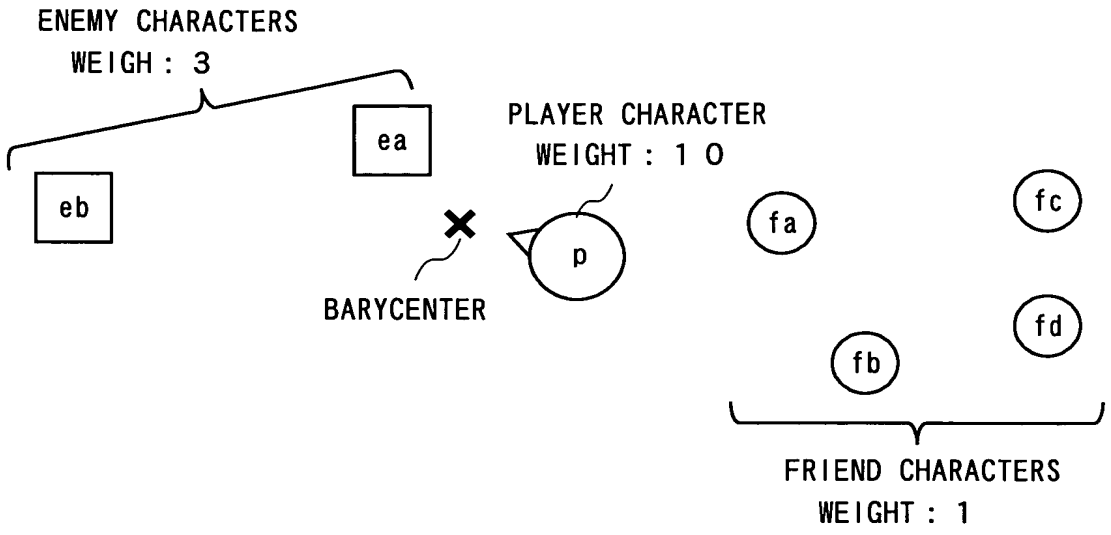

ENEMY CHARACTERS
WEIGH : 3
ea
eb
PLAYER CHARACTER
WEIGHT : 10
p
BARYCENTER
fa
fc
fd
fb
FRIEND CHARACTERS
WEIGHT : 1

FIG. 18

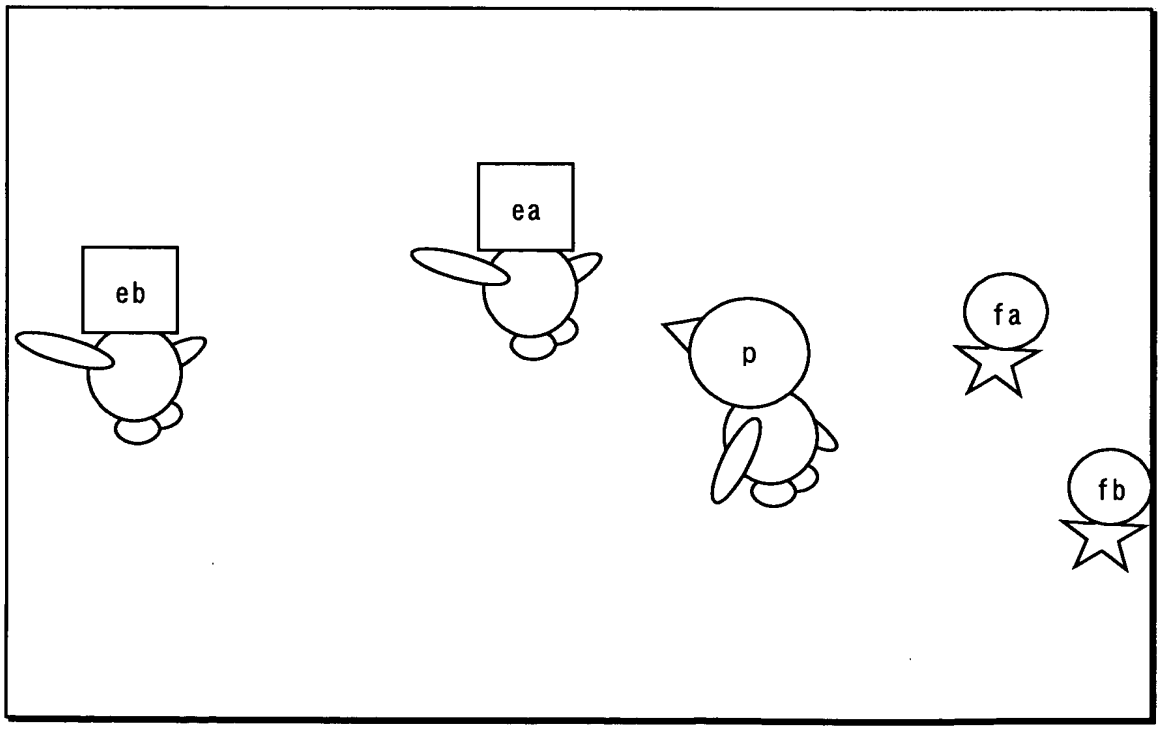

ea
eb
p
fa
fb

FIG. 19

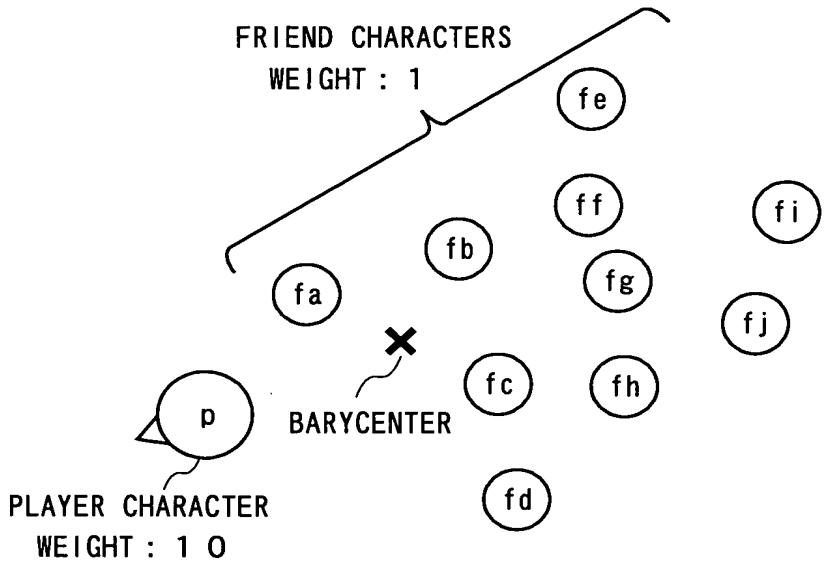

FRIEND CHARACTERS
WEIGHT : 1
fe
ff
fi
fb
fg
fa
fj
fc
fh
p
BARYCENTER
PLAYER CHARACTER
WEIGHT : 10
fd

FIG. 20

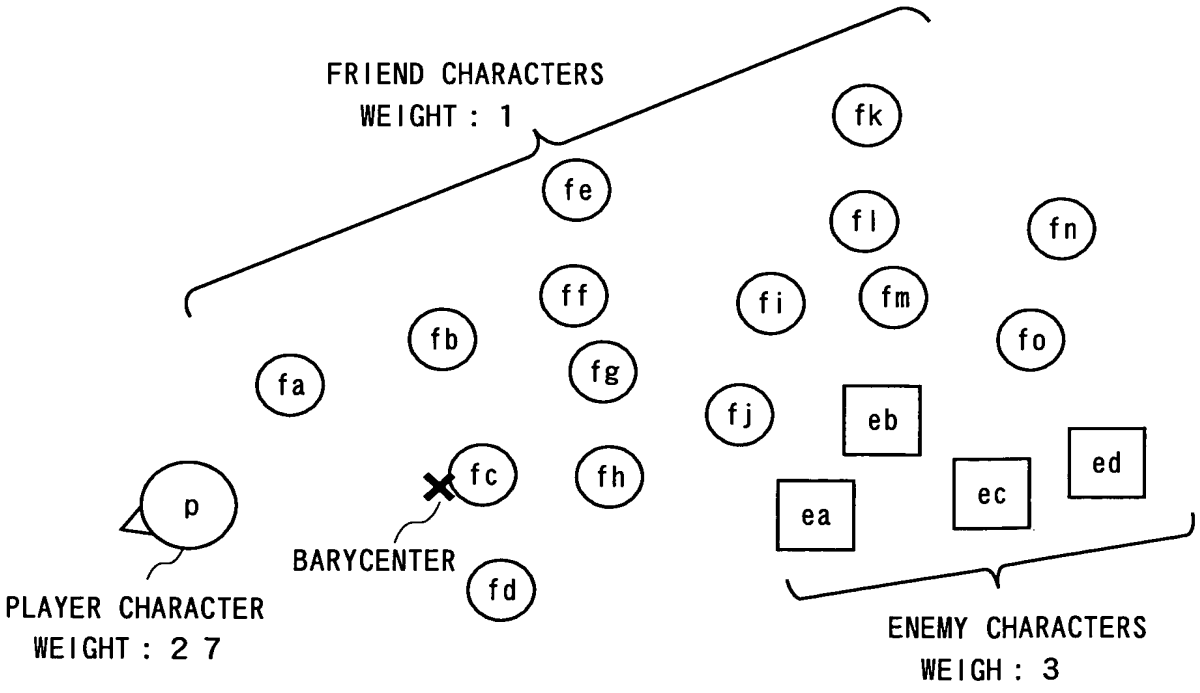

FRIEND CHARACTERS
WEIGHT : 1
fk
fe
fl
fn
ff
fi
fm
fb
fo
fg
fa
fj
eb
ed
fc
fh
ec
p
ea
BARYCENTER
fd
PLAYER CHARACTER
WEIGHT : 27
ENEMY CHARACTERS
WEIGH : 3

FIG. 21

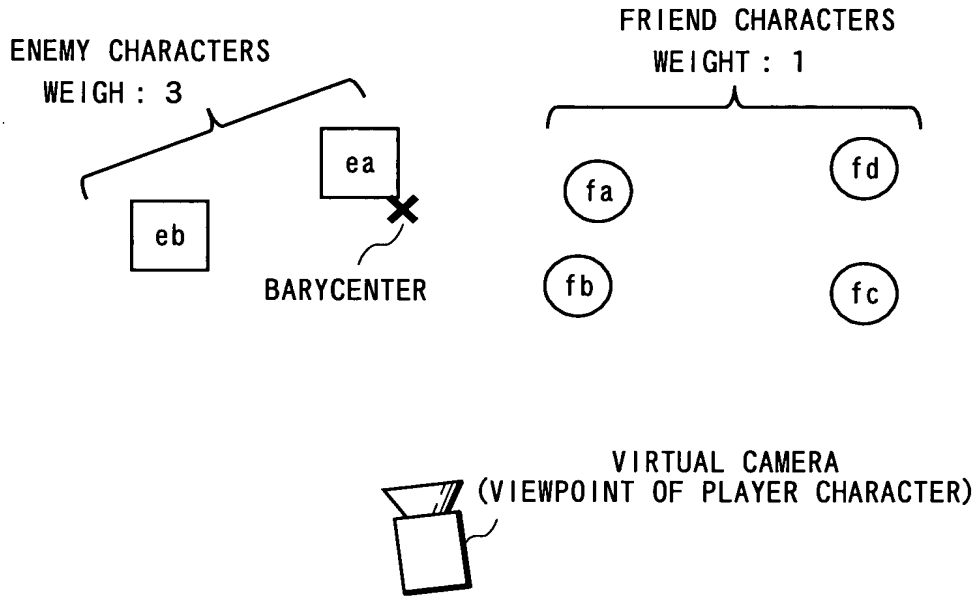

ENEMY CHARACTERS
WEIGH : 3
ea
eb
BARYCENTER
FRIEND CHARACTERS
WEIGHT : 1
fa
fd
fb
fc
VIRTUAL CAMERA
(VIEWPOINT OF PLAYER CHARACTER)

FIG. 22

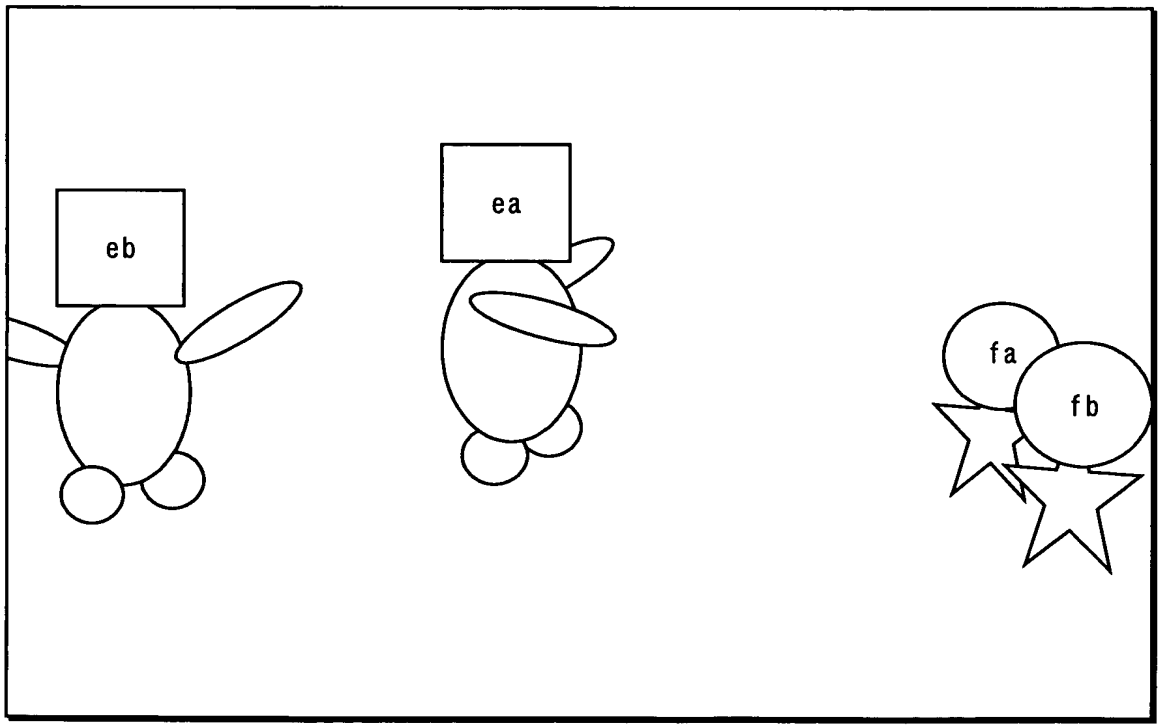

eb
ea
fa
fb

FIG. 23

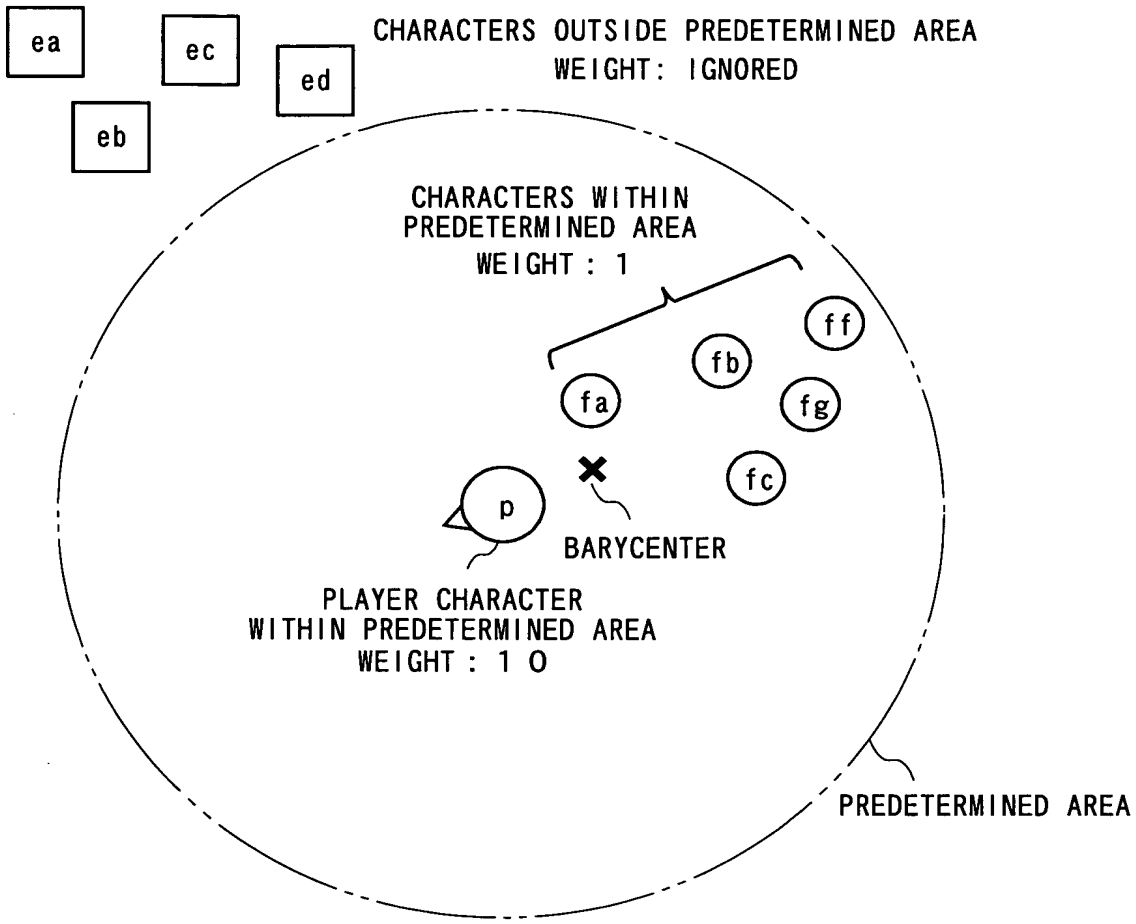

ea
ec
ed
eb
CHARACTERS OUTSIDE PREDETERMINED AREA
WEIGHT: IGNORED
CHARACTERS WITHIN
PREDETERMINED AREA
WEIGHT : 1
ff
fb
fa
fg
fc
p
BARYCENTER
PLAYER CHARACTER
WITHIN PREDETERMINED AREA
WEIGHT : 10
PREDETERMINED AREA

FIG. 24

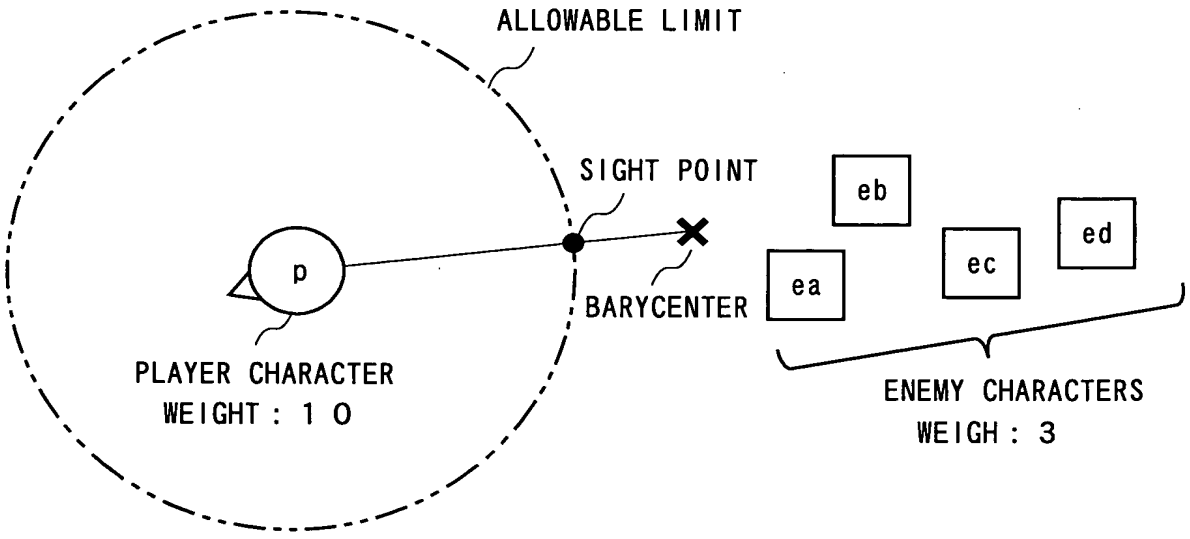

ALLOWABLE LIMIT
SIGHT POINT
eb
ed
ec
ea
p
BARYCENTER
PLAYER CHARACTER
WEIGHT : 10
ENEMY CHARACTERS
WEIGH : 3

FIG. 25

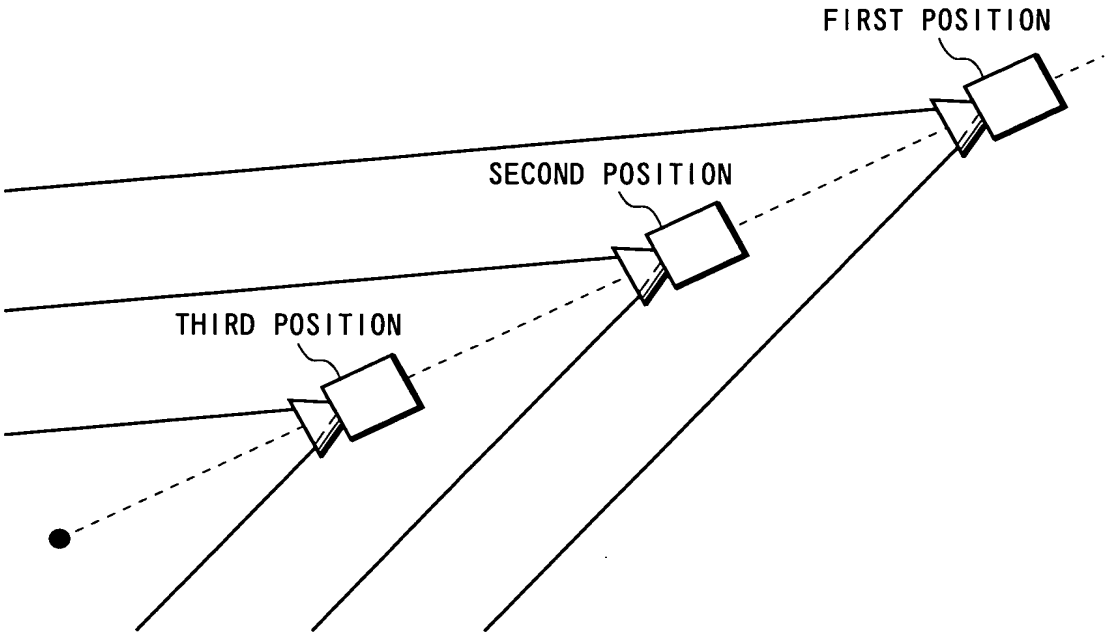


FIG. 26

CHARACTER	POSITION OF VIRTUAL CAMERA	WEIGHT
PLAYER CHARACTER	FIRST POSITION	10
	SECOND POSITION	30
	THIRD POSITION	50

FIG. 27

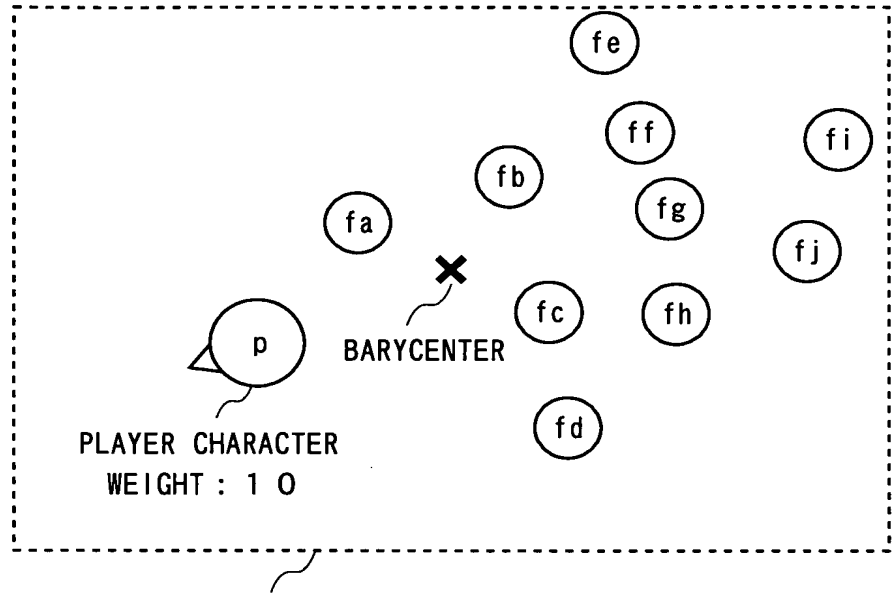
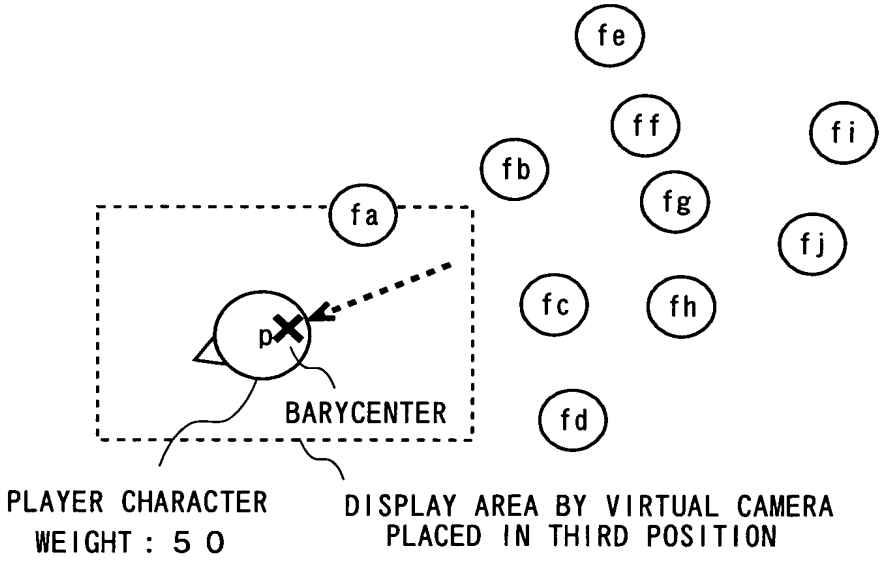

fe
ff
fi
fb
fg
fa
fj
fc
fh
p
BARYCENTER
fd
PLAYER CHARACTER
WEIGHT : 10
DISPLAY AREA BY VIRTUAL CAMERA PLACED IN FIRST POSITION

FIG. 28


fe
ff
fi
fb
fg
fa
fj
fc
fh
p
BARYCENTER
fd
PLAYER CHARACTER
WEIGHT : 50
DISPLAY AREA BY VIRTUAL CAMERA
PLACED IN THIRD POSITION